Box No. VIII (iv) DECLARATION: INVENTORSHIP (only for the purposes of the designation of the United States of America)

The declaration must conform to the following standardized wording provided for in Section 214; see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general) and the specific Notes to Box No. VIII (iv). If this Box is not used, this sheet should not be included in the request.

Declaration of inventorship (Rules 4.17(iv) and 51*bis*.1(a)(iv)) for the purposes of the designation of the United States of America:

I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought.

This declaration is directed to the international application of which it forms a part (if filing declaration with application).

This declaration is directed to international application No. PCT/..... (if furnishing declaration pursuant to Rule 26*ter*).

I hereby declare that my residence, mailing address, and citizenship are as stated next to my name.

I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications," by application number, country or Member of the World Trade Organization, day, month and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.

Prior Applications: GB.0403762.8 . . Filed .20.February.2004 .....
Our Ref: IP/P7311 .....

I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name: Dr Edward Steven WARNER .....

Residence: United Kingdom .....
(city and either US state, if applicable, or country)

Mailing Address: . QinetiQ Limited, Malvern Technology Centre, St Andrews Road, Malvern WR14 3PS .....
Worcestershire, United Kingdom .....

Citizenship: British .....

Inventor's Signature: E. S. Warner ..... Date: 02/03/05 .....
(if not contained in the request, or if declaration is corrected or added under Rule 26*ter* after the filing of the international application. The signature must be that of the inventor, not that of the agent)

(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26*ter* after the filing of the international application)

Name: .....

Residence: .....
(city and either US state, if applicable, or country)

Mailing Address: .....
.....

Citizenship: .....

Inventor's Signature: ..... Date: .....
(if not contained in the request, or if declaration is corrected or added under Rule 26*ter* after the filing of the international application. The signature must be that of the inventor, not that of the agent)

(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26*ter* after the filing of the international application)

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iv)".

ABSTRACT

Frequency compensated communications reception includes compensating for frequency offset in a received signal by constructing a reference signal for comparison with a training sequence in a received signal. The reference signal is formed from basis functions and the training sequence. It is obtained by minimising a cost function J constructed from an adaptively weighted combination of basis functions, the training sequence, the received signal and a constraint requiring non-zero signal power. Multi-element antenna signals are weighted with a beamforming weight vector $\mathbf{w}$ in J given by $\|\mathbf{Xw}-\mathbf{CFv}\|^2+\lambda\left(\mathbf{w}^H\mathbf{X}^H\mathbf{Xw}-1\right)$, where $\mathbf{X}$ is a matrix of received signal samples, $\mathbf{C}$ is a diagonal matrix containing elements of the training sequence, $\mathbf{F}$ is a matrix having columns defining basis functions, $\mathbf{v}$ is a vector of adaptive weights, index H indicates complex conjugate transpose and λ is a Lagrange multiplier constraining beamformer power. A single element antenna signal $\mathbf{x}$ is scaled in J given by $\|\alpha\mathbf{x}-\mathbf{CFv}\|^2+\lambda\left(\alpha^*\mathbf{x}^H\mathbf{x}\alpha-1\right)$, where α is a scaling factor, * indicates a complex conjugate, and $\mathbf{x}$ is a vector of received signal samples.

Figure 3 should accompany the Abstract